

**National Transportation Safety Board
Washington, DC 20594**

Brief of Accident

Adopted 12/06/2002

DEN02LA019 File No. 12510		01/11/2002	Aurora, CO	Aircraft Reg No. N902AM	Time (Local): 08:40 MST		
Make/Model:	McDonnell Douglas / MD 902				Fatal	Serious	Minor/None
Engine Make/Model:	Pratt & Whitney / PCE-BG0027			Crew	0	0	2
Aircraft Damage:	Substantial			Pass	0	0	1
Number of Engines:	2						
Operating Certificate(s):	None						
Type of Flight Operation:	Instructional						
Reg. Flight Conducted Under:	Part 91: General Aviation						
Last Depart. Point:	Englewood, CO			Condition of Light:	Day		
Destination:	Local Flight			Weather Info Src:	Weather Observation Facility		
Airport Proximity:	Off Airport/Airstrip			Basic Weather:	Visual Conditions		
				Lowest Ceiling:	250 Ft. AGL, Broken		
				Visibility:	10.00 SM		
				Wind Dir/Speed:	220 / 008 Kts		
				Temperature (°C):	3		
				Precip/Obscuration:	None / None		
Pilot-in-Command	Age:	41	Flight Time (Hours)				
Certificate(s)/Rating(s)				Total All Aircraft:	9436		
Flight Instructor; Commercial; Single-engine Land; Helicopter				Last 90 Days:	146		
Instrument Ratings				Total Make/Model:	229		
Helicopter				Total Instrument Time:	205		

An instructor pilot was conducting transition training and was demonstrating emergency procedures on anti-torque malfunctions and loss of thrust/fixed pedal settings. After reaching a final approach position at approximately 100 feet agl, he began to demonstrate how to complete an approach with an "Anti-Torque Failure - Fixed Thruster Setting." He established the helicopter on a "shallow" approach angle with a deceleration attitude of approximately 15 to 20 degrees nose up and approximately 300 feet per minute rate of descent. The flight profile "appeared normal" until about 50 to 60 feet above ground level when the helicopter started to descend at a higher than desired rate for demonstration. The pilot applied collective lever control and a shudder was felt in the rotor system, followed by an increase in descent rate. Collective lever application could not arrest the descent. The helicopter struck the ground hard in a nose high attitude, ballooned into the air approximately 3 to 5 feet and slowly rotated approximately 360 degrees. The "thruster" was jammed in the neutral position, but he had no problem landing the helicopter from a hover with power. The helicopter sustained substantial damage to the Notar Anti-Torque rotating thruster cone, the aft cross tube, and both landing gear skids.

Brief of Accident (Continued)

DEN02LA019

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01/11/2002

Aurora, CO

Aircraft Reg No. N902AM

Time (Local): 08:40 MST

Occurrence #1: LOSS OF CONTROL - IN FLIGHT

Phase of Operation: DESCENT

Findings

1. (F) WEATHER CONDITION - HIGH DENSITY ALTITUDE
2. (F) PLANNED APPROACH - IMPROPER - PILOT IN COMMAND(CFI)
3. (F) VORTEX RING STATE - ENCOUNTERED - PILOT IN COMMAND(CFI)
4. (C) SETTLING WITH POWER - INADVERTENT - PILOT IN COMMAND(CFI)

Occurrence #2: HARD LANDING

Phase of Operation: DESCENT - UNCONTROLLED

Findings

5. TERRAIN CONDITION - OPEN FIELD

Findings Legend: (C) = Cause, (F) = Factor

The National Transportation Safety Board determines the probable cause(s) of this accident as follows.

the pilot's failure to maintain aircraft control due to inadvertent settling with power resulting in a hard landing. Contributing factors include the improperly planned approach, the high density altitude, and the encounter with vortex ring state.